ABSTRACT

A current-perpendicular-to-plane (CPP) giant magnetoresistive (GMR) sensor of the synthetic spin valve type is provided, the sensor comprising a GMR stack having a substantially square lateral cross-section, a Cu spacer layer of smaller square cross-section formed centrally on the GMR stack and a capped ferromagnetic free layer of substantially square, but even smaller cross-sectional area, formed centrally on the spacer layer. The stepped, reduced area geometry of the sensor provides a significant improvement in its GMR ratio (DR/R), a reduced resistance, R, and elimination of Joule heating hot-spots in regions of high resistance such as the antiferromagnetic pinning layer and its seed layer.